Human Nail disease Diagnosis Using Machine Learning

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ABSTRACT

In order to diagnose many disorders early on, human hand nails are examined. In the healthcare industry, a person's hand nail colour can be studied to identify a certain condition. The suggested system provides guidance for making a diagnosis of the disease in such a situation. Person nail image is the input for the suggested system. In order to diagnose diseases, the system will process the quotation image and extract properties from it. The suggested approach leverages variations in nail colour to identify diseases among the many characteristics of the human nail. Here, the Weka tool is used to build the first training set of data from photographs of the nails of patients with particular disorders.
The outcome are obtained by comparing the feat ures from the input nail images with the training data. .In this study, using the color properties of nail images, we found that the results of our eval uation reached an average of 65% data in educat ion.
Keywords—Nail, color analysis, weka, classifier, image processing

I.INTRODUCTION

Many medical conditions can be predicted by looking at a person's nail color. Because the human eye has a sense of color and resolution, there must be a way to examine the nails to predict disease . Therefore, the human eye will not see the small color change in a few pixels of the nails, which could result in an incorrect outcome. However, a computer can detect minute colour changes on nails.
The proposed method will extract the color from images of human nails for disease prediction. The method mainly focuses on image recognition using the analysis of human nail color. During this process, the camera is used to record the image of the human hand. Captured images are sent to our system and objects are selected from the nail area. The selected area is then treated to remove nail products such as nail polish. A simple matcher algorithm is used to match the nail's colour feature in order to forecast illness. The technique is helpful in predicting diseases in their early stages in this way. In our literature review, we mentioned a few disorders and the linked nail colour changes.

II EXISTING SYSTEM

There are various systems in place that use changes in the colour of the human palm to forecast sickness. Method suggested by Pandit et al. Check out some pictures and use information about medical palmistry for disease prediction. Medical palmistry is a science that uses the appearance of the nails and palms to diagnose some illnesses. This model is explained and shown for extracting an interesting area of an image for subsequent processing using the example of medical palmistry. This technique is designed to function with various human skin tones and successfully determine the colour of the palm from an image of the palm. It also improves the accuracy of such palm observations[2]. In the scanned image of the palm, the margins have a darker colour than the palm itself. The estimate of the average colour of the palm may be affected since the exact boundary of the palm may not be identified. Techniques for image enhancement were employed to fix those issues. However, this process takes time, therefore it will require extra time to evaluate nails. Therefore, it is simple to

extract nail features since our system uses a digital camera or a mobile camera to obtain high-quality images. Another device uses digital image processing to analyse nail colour to identify illnesses. The system presented by Hardik Pandit et al.observes nail colour using medical science principles as a base, and its result is a forecast of disorders, if any are identified.

The proposed model describes the same function s without human intervention. The model surpas ses human vision as it has the ability to surpass t he learning and problemsolving abilities of the h uman eye. As was previously noted, specific disorders are indicated by varied nail colours. Authors compared user's nails to computer-based reference colour values of sick nails in order to put this model into practise. In other words, the nail colours in the user-input photographs would be compared to these reference colours.[4]

III PROPOSED SYSTEM

There are several techniques to diagnose diseases, including through various tests (blood, urine, etc.) and symptoms present in various bodily sections that serve as indicators.We present a technology that will use nail images as input and predict possible infections based on color changes. We are not particularly concerned with system correctness as this is only the first step towards a perfect system. The major goal of this system design is to offer a healthcare application that is advantageous in terms of time and cost. The proposed system will complete thr input image after taking the nails as input.Then finally predicted the disease.Both the patients and doctors can use this tool in treatment.

Block Diagram of System

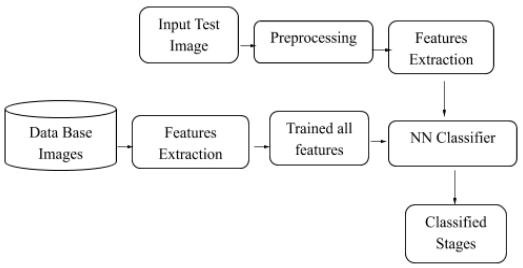

Fig 1: Architecture Flow

A. Data Input Limitations: i. Nails must be clean and free of any artificial markings or colours, such as nail polish. ii. The photo should be taken in ideal lighting conditions. iii. The background of the image should be either white or black. iv. A clear, no-flash photo should be taken.

B. Training Data Set Using Wekas

In the ESDDS system, the Weka tool is suggested for training data (patients' nail photos). Here, we've gathered pictures of hospital patients. The average RGB values of these photos are determined using imageUtils.java, which then classifies them using diseaseclassifier.java. 1. The Weka tool is used to train patient input photos. 2. To categorise and train patient data, we employed the j48 classifier (c4.5 algorithm) in this study. 3. To produce decision trees, the algorithm C4.5 is utilised. C4.5 can generate decision trees that can be used for classification,so it is often referred to as classification statistics.[6]

IV MODULES

A.PREPROCESSING

Preprocessing aims to improve image data by reducing unwanted distortions or improving visual content important for postprocessing . Preprocessing is a term used to describe the work done on the image in the first step. It is the image density input and output.

Image reconstruction is the process of approximating the original image from a negative video or image. Obscure issues, noise, and camera focus are just a few examples of corruption.. Image enhancement, as opposed to image restoration, focuses on aspects of the image that make it more aesthetically acceptable to the viewer. When using image enlargement, the rendering process has no precedent offered by "Imaging packages," such as contrast stretching or nearest neighbour deblurring. By compromising some resolution, noise can be effectively removed from images using image enhancement, but this is not acceptable in many applications. The z-direction resolution in a fluorescence microscope is already poor. To recover the item, more sophisticated image processing techniques must be used. A technique for restoring images is de-convolution. It can increase resolution, particularly in the axial direction, reduce noise, and boost contrast.

B.GRAY SCALE IMAGE

on a grayscale Each pixel's value in a digital image is a single sample, meaning that it only contains information about intensity. Images of this type, commonly referred to as "black-and-white," are made up entirely of shades of grey (0–255), ranging from white (255), at the maximum intensity, to black (0), at the weakest. In the context of computer graphics, black and white images are images that have only two colors, black and white, as opposed to gray images (also known as binary or binary images).There are numerous shades of grey in between in grey scale photos. Images in grey scale are also referred to as monochromatic, which indicates that there is no chromatic variation. When only a specific frequency is recorded, grey scale images are monochromatic proper. Grayscale images are usually created by measuring the intensity of light in each pixel along the spectrum of the electromagnetic spectrum (eg infrared, visible, ultraviolet, etc.). However, they can be created from full-color images; see the article on converting to grayscale for details.

C.BINARY IMAGE

A digital image that has only two possible values for each pixel is called a binary image. Although any two colours may be used, black and white are typically the two colours utilised for binary images. The colour used for the image's foreground object(s) is different from the colour used for the backdrop of the image. Bilayer image or biphasic image is another name for binary image. This means that one bit is reserved for each pixel (0 or 1). The concept is sometimes called black and white, monochrome, or monochrome, but can also refer to an image with only one pattern per pixel, including grayscale images. In digital image processing, binary images are often caused by masking or dithering. Some input/output devices, such as laser printers, fax machines, and two-layer computer monitors, can only use two-layer images.[10]

IV RESULTS AND ANALYSIS

PRE PROCESSING:

Preprocessing includes separating the nail from the finger images and applying color correction, nail plate registration, and image sizing.

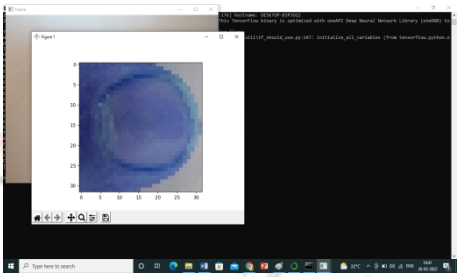

Fig 2: Preprocessing

COLOUR CONVERSION:

The technology uses the colour of the nails to calibrate itself. The nail area is then extracted

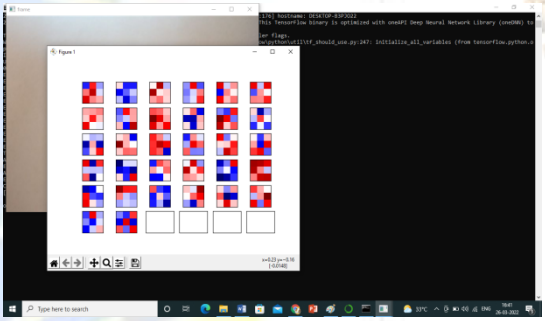

Fig 3 : Conversion of color

GREY COLOUR CONVERSION

We propose an image-dependent technique for determining color-to-grayscale conversion that analyses the actual colours in an image or image component

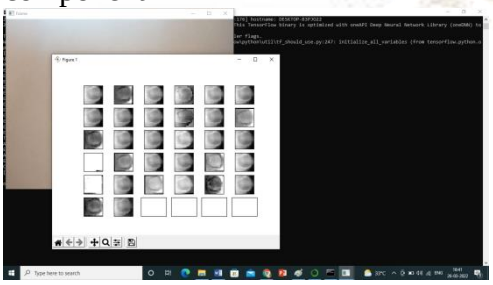

Fig 4: Grey Color conversion

IMAGE QUALITY IMPROVISING:

The integrity and quality of nails have a significant impact on feature extraction. as a result,image quality has been improved

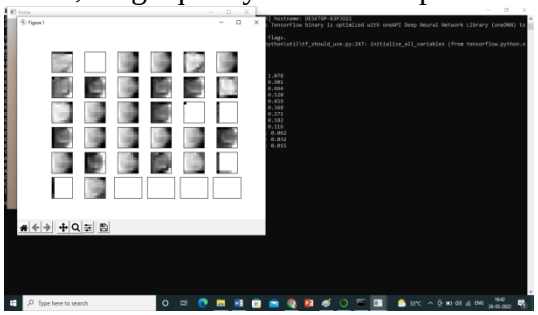

Fig 5: Improvising

OUTPUT:

As a result, the condition is diagnosed by a human nail that has been photographed or captured.

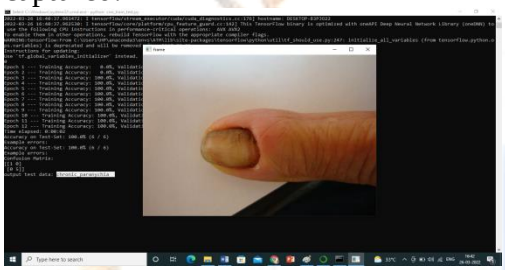

Fig 6: Capturing Output

VI CONCLUSION AND FUTURE WORK

Conclusion

The five main elements of the nail are crescent, cuticle, root, plate and line. Pegboards are used in ESDD systems. Methods are currently used to identify the nail in both healthy and diseased areas and to predict potential infections. Here, nail colour (average RGB value) is used as a nail characteristic for disease prediction. The model gives better results than human vision as it exceeds the limits of the human eye. The RGB meaning of the nail color in the input image is used in the preparatory work for the classification of the disease, but in the future we may add other nail features such as the pattern of the nail. Along with these characteristics, we may additionally gather more patient symptoms to add to our system's input for disease prediction. combining nail traits, such as colour and pattern, with additional patient symptoms to produce more precise results. It combines text with features derived from other human bodies, such as nail features.

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